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# Teaching Portfolio

February 2017

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## 1. Teaching Philosophy

In primary school I rather wanted to play football. In gymnasium, I still preferred playing football. At university, I loved to study architecture, but understood teaching to be as close to boredom as possible. During my starting years in research, conversations with colleagues and students initiated an interest in modes and techniques of knowledge transfer and collective learning. Today, I teach because I enjoy the direct relation to like minded students and colleagues, to discuss openly the field of architecture and to advance, as a community, architectures capacities to increase the quality of life for humans. I am in academia because I believe it gives the best conditions for exploring and advancing my knowledge and passion on the making of architecture.

I teach through developing integrative design approaches, related directly to my research on 'Environmental Tectonics' in architecture, including novel tools, techniques, design processes, knowledge and pedagogics. It is a privilege and pleasure that my teaching and research are closely related, making it possible to explore research agendas through teaching curricula and expand my teaching practice through experimental and theoretical design research.

All teaching is based on integrated architectural design processes (IDP), which means to include aspects from architecture and associated fields within the early design processes. For this reason, processes operate on hybrid-disciplinary models, from the sciences and humanities. Teaching activities often involve a mix between the making of computational design systems and experimental full-scale prototypes. This approach of making as an integral method of learning (Speaks 2007) I believe to increase the focus on both solution- and problem-solving aspects at the same time, which leads to the co-evolution processes of learning and making (Maher & Poon 1996). These two are in my (and others, Ingold 2013) philosophy of teaching inseparable. And, all teaching activities (lectures, workshops, summer schools, websites, podcast, fora, pin-up sessions, supervision sessions and making etc.) are based on the attempt to promote a dialogue, rather than a teachers monologue. The latter, however, should not be understood as an idea that explicit knowledge and threshold concepts have decreased value. On the contrary, threshold concepts are necessary and can be used to activate new domains of inquiry and explorative study activities. Hence, it invite students' personal perspectives and critical approaches to the aspects studied during teaching.

Concretely, I organize teaching in two general modes; intensive 'studio modes' and open 'project modes'. Studio modes are specified and focused design/making tasks that are based upon a selective design method, a limited set of materials and restricted functional requirements. It attempt to train the students to critically select and apply specific design aspects that will have the largest positive impact on a design problem. It is a response to an observation I made from early on; that the multitude of aspects, problems and solutions in architecture can prohibit deep learning, which may lead to the negative effect of 'surface learning' (Biggs and Tang, 2007). This is due to the complexity of the relations, which shadow the depth and meaning of the separate elements before they are meaningfully combined. In tandem, it follows, often, the idea of applying 'primary-generators' (Darke, 1978), which are a single or a few specified drivers that co-evolve the design from concept to application. This has led to what I refer to as 'Sequential Integrated Design Processes' (Foged, 2012, 2016, 2017), as opposed to open, vaguely defined design processes.

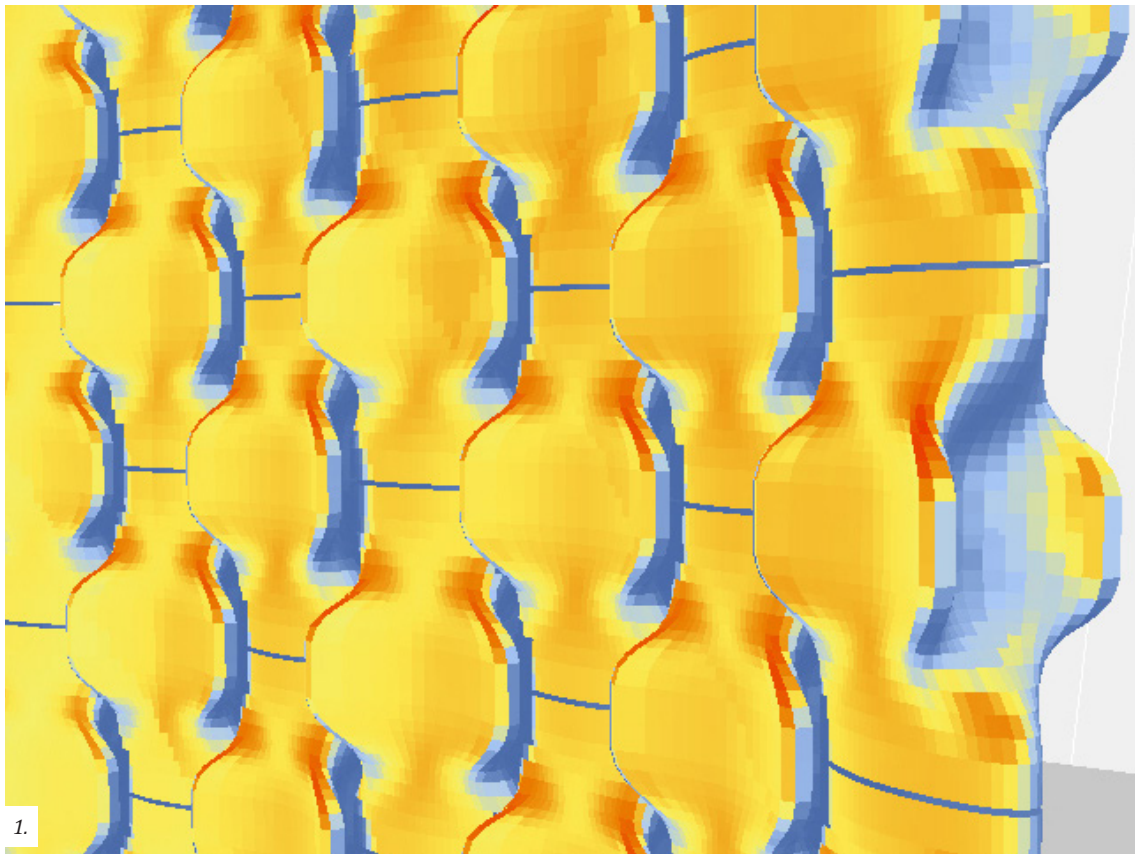
Following these design processes, students are intended to gradually understand and integrate more aspects, yet, focus is maintained on a few central elements to maintain clarity and consistency within the design conjecture. Project modes intent to make the student search and define much more on own interests. Understanding and managing complexity of the many aspects is a sub-study of its own in a project mode. This means to reduce specificity of the task from my side, yet inserting a few short workshops on relevant topics during the project mode period to catalyse and question the on-going work of the student. It serves to train the student in self-induced creative processes and individual mapping of knowledge and techniques to address wicked problems. Each mode applies a series of teaching strategies and tactics that you will find below.

Somehow, learning in academia, at least in architecture, is much like learning the knowledge and skills of sports, thinking and doing are inseparable and the closer the two are connected, the higher level is achieved.

A handwritten signature in dark ink, appearing to read 'iwf' or 'isak', with a stylized, flowing script.

Isak Worre Foged  
February 2017





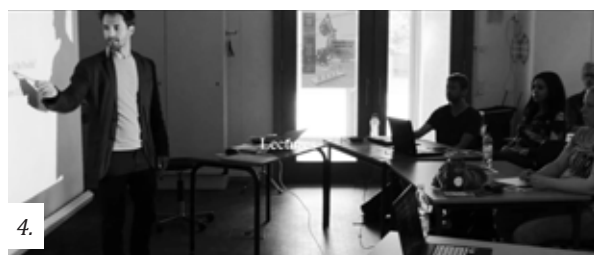
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**Utzon(x) Summer School 2016**  
[www.utzonx.aau.dk](http://www.utzonx.aau.dk)

*1. Thermal simulation of an assembly of robotic made clay modules in the Utzon Center.*

*2. X-module being extruded by a robot arm.*

*3. Teacher Johannes Braumann documenting while participant Ioanna Symeonidou is test making a prototype.*

*4. Lecturing on creative, robotic design processes during Utzon(x) summer school.*

*Photos by IW Foged, I Symeonidou*

## 2. Teaching Curriculum

### 2.1 General description

My teaching activities include the development and organization of course modules (5-10 ECTS) and project modules (20-30 ECTS), lectures in different formats for BA, MA and PhD programmes, 2-14 day workshops and supervision of bachelor and master student projects at the architectural program. I have developed and organized 20+ unique projects and workshops from scratch, supervised 35+ project groups and 350+ solo projects within course modules (studio mode) amounting to more than 5500 hours of teaching activities within architecture and architectural engineering.

Recent teaching activities include Acoustic Tectonics (MA.), Tectonic Architecture (MA.), Utzon(x) Summer School (MA., PhD.), Thermal Responsive Systems (MA.) Environmental Tectonics (MA.) and Research by Design (MA.).

I also organize and develop the Utzon(x) Lectures Series and Utzon(x) Summer Schools. The lecture series is providing a platform for inviting and discussing architectural approaches by invitation of peers in practice and research. Lectures are open to students at all levels and to the public. The summer school is open to AAU and non-AAU students across levels (BA, MA, PhD). It invites a series of peers to interact with research and education condensed in an intense 9-12 day workshop with the aim to explore and build through a research by design methodology.

I periodically act as invited critic and lecturer at the CITA Studio (MA.) at the Danish Royal Academy of Fine Arts, School of Architecture, where student projects are discussed based on the attempt to integrate advanced computational design methods into architectural design processes.

### 2.2 Specific description

Grouped by year, topics listed include: Lectures, Supervision, Examination, Workshops, Coordination, Constructions, Quiz, Podcasts, Websites

MA4Arch.: 4th semester master program in Architecture (Thesis project)  
MA3Arch.: 3rd semester master program in architecture (Design Research)  
MA2Arch.: 2nd semester master program in architecture (Sustainable Architecture)  
MA1Arch.: 1st semester master program in architecture (Tectonics Architecture)  
BA5DigitalArch.: 5th semester bachelor program in digital architecture  
BA5Arch: 5th semester bachelor program in architecture  
BA4Arch: 4th semester bachelor program in architecture  
BA3Arch: 3rd semester bachelor program in architecture  
MA1Urb: 1st semester master program in urban design  
BA3Urb: 3rd semester bachelor program in architecture

2016:

#### Lectures

'Acoustics and Structures', MA1Arch, AAU  
'Experimental Processes in Architecture', MA., KADK

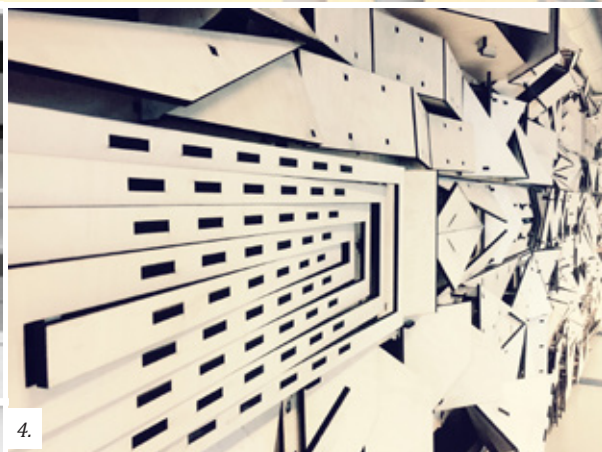




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**Acoustic Tectonic Studio 2016**  
[www.acoustictectonics2016.wordpress.com](http://www.acoustictectonics2016.wordpress.com)

1. Students setup of individual prototypes to form a collective project.

2. CNC manufacturing processes as part of making/learning.

3. Acoustic measurements of the students work after installation.

4. Assembly of 70 projects into an eclectic acoustic wall.

Photos by IW Foged

'Architectural Acoustics – Theory', MA1Arch, AAU  
 'Architectural Acoustics – Applied', MA1Arch, AAU  
 'Simulating Architectural Acoustics', MA1Arch, AAU  
 'Experimental Architectural Design Processes', MA1Arch, AAU  
 'Acoustics Architecture and Design Pedagogics', MA1Arch, AAU  
 'Clay as Thermal Agent in Architecture', BA, MA, PhD, Utzon(x) AAU  
 'Edge of the Possible', BA, MA, PhD, Utzon(x), AAU  
 'Dynamic Responsive Architectures', MA2Arch, AAU  
 'Environmental Tectonics', MA2Arch, AAU  
 'Sustainable Urban Housing' MA2Arch, AAU

#### *Supervision and Examination*

2 student groups, 'Sustainable Architecture', MA2Arch, AAU  
 4 student groups, 'Thesis project', MA4Arch, AAU.  
 72 students, 'Acoustic Tectonic Studio', MA1Arch, AAU  
 20 students, invited reviewer 'CITA Studio', MA, KADK

#### *Podcasts*

'Architectural Acoustics – Theory', MA1Arch, AAU  
 'Architectural Acoustics – Applied', MA1Arch, AAU

#### *Quizzes*

'Acoustics and Architecture', MA1Arch, AAU  
 'Tectonics in Architecture', MA1Arch, AAU

#### *Coordination (development and organisation)*

■ 'Utzon(x) Lectures, Summer School and Symposium', AAU - Website: [www.utzonx.aau.dk](http://www.utzonx.aau.dk)  
 'Utzon(x) Lecture Series, (cross semester lecture series), AAU  
 'Thesis semester project' (30 ECTS), MA4Arch, AAU  
 'Tectonic Architecture' (20/30 ECTS semester and project module), MA1Arch, AAU

■ 'Acoustic Tectonic Studio' (5 ECTS course module), MA1Arch, AAU

The studio explores and applies architectural acoustics through early design processes to manufacturing processes and production of 1:1 prototypes. It integrates in this course; aspects of architectural acoustics, architectural parametric design, architectural theory and computer numerical controlled (CNC) manufacturing processes. Website: [www.acoustictectonics2016.wordpress.com](http://www.acoustictectonics2016.wordpress.com)

#### *Workshops*

'Acoustics and Structure' (3 days), MA1Arch, AAU  
 'Sustainable Urban Housing' (2 days), MA2Arch, AAU  
 'Utzon(x) Summer School' (9 days), BA, MA, PhD, AAU

#### *Constructions in teaching*

'Acoustic Tectonics Walls 2016' Full-scale acoustic walls in plywood, MA1Arch, AAU  
 (External industrial collaboration: Keflico)  
 'Utzon(x) Robotic Clay Walls: Thermal Modular Tiles by Robotic Processes', BA, MA, AAU  
 (External industrial collaboration: Association for Robots in Architecture and JHA)

2015:

#### *Lectures*

'Environmental Tectonics', MA1Arch, AAU  
 'Architectural Acoustics – Theory', MA1Arch, AAU





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**Acoustic Tectonic Studio 2015**  
[www.acoustictectonics.wordpress.com](http://www.acoustictectonics.wordpress.com)

1. Students inspect and use the created pavilion after construction.

2. Pavilion located in open campus atrium for exhibition and reading space.

3. Acoustic measurements of the students work after installation.

Photos by IW Foged

'Architectural Acoustics – Applied', MA1Arch, AAU  
'Experimental Design Processes', MA1Arch, AAU  
'Manufacturing of Responsive Models', MA and PhD level, Aarhus School of Architecture

*Supervision and Examination*

96 students, 'Acoustic Tectonic Studio', MA1Arch, AAU  
4 student groups, 'Tectonic Architecture', MA1Arch, AAU  
20 students, invited reviewer 'CITA Studio', MA.Arch, Copenhagen School of Architecture  
1 student, 'Long thesis projects', MA4Arch, AAU  
1 student, 'Design Research', MA3Arch, AAU

*Coordination (development and organisation)*

'Utzon(x) Lecture Series, Summer School and Symposium', AAU - Website: [www.utzonx.aau.dk](http://www.utzonx.aau.dk)

'Tectonic Architecture' (20 ECTS project module), MA1Arch, AAU

----- ■ 'Acoustic Tectonic Studio' (5 ECTS course module), MA1Arch, AAU

The studio explores and applies architectural acoustics through early design processes to manufacturing processes and production of 1:1 prototypes. It integrates in this course; aspects of architectural acoustics, architectural parametric design, architectural theory and computer numerical controlled (CNC) manufacturing processes. Website: [www.acoustictectonics.wordpress.com](http://www.acoustictectonics.wordpress.com)

*Constructions in teaching*

'Acoustic Tectonics Pavilion 2015' Full-scale pavilion in plywood, MA1Arch, AAU (see page x)

2014:

*Lectures*

'Environmental Tectonics', MA2Arch, AAU  
'Environmental Simulation Models', MA.Arch, Utzon(x) Summer School, AAU  
'Dynamic Architectures', MA2Arch, AAU  
'Architecture and Mathematics', Teacher's Mathematics Association, Denmark

*Supervision and Examination*

18 students, 'Utzon(x) Summer School', MA.Arch and PhD level, AAU  
20 students, Invited reviewer 'CITA Studio', MA.Arch, Copenhagen School of Architecture

*Workshop (coordination, instructions and supervision)*

'Tectonics Beyond Technology' (3 ECTS), Utzon(x) Summer School 2013, MA.Arch, AAU

*Coordination (development and organisation)*

'Utzon(x) Lectures, Summer School and Symposium', AAU  
'Utzon(x) International Symposium on Bricks and Tectonics, AAU  
'Utzon(x) Lecture Series, (cross semester lecture series), AAU

*Constructions in teaching*

'Complex Brick Assembly Prototypes' Full-scale brick prototypes, MA.Arch, Utzon(x) AAU

2013:

*Lectures*

'Material Dynamic Systems', MA.Arch, Copenhagen School of Architecture  
'Cellular Automata in Architecture', MA1Urb, AAU  
'Information Systems', MA1Urb, AAU





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**Utzon(x) Summer School 2013**  
[www.utzonx.aau.dk](http://www.utzonx.aau.dk)

1. Students document the final assembly of the summer school pavilion.

2. Student searching a particular element of the parametric design and manufactured components.

3. Students painting the wood to effect the light conditions inside the pavilion based on simulation studies.

4. Colour composition based on design studies of variation and repetition, solar energy absorption and reflection.

Photos by IW Foged



'Environment as a Generator for Architectural Design', MA.Arch, AAU  
'Experimental Tectonics', MA.Arch, Copenhagen School of Architecture  
'Environmental Tectonics', PhD programme, Copenhagen School of Architecture  
'Architecture and Mathematics', Danish Society of Mathematicians

*Supervision and Examination*

3 students, 'Design Research', MA3Arch, AAU  
20 students, 'Utzon(x) Summer School', MA.Arch, AAU  
70 students, Aero Architectural Studio, BA4Arch, AAU  
10 students, 'Internship in practice', MA3Arch, AAU

*Coordination (development and organisation)*

'Design Research' (30 ECTS project module), MA3Arch, AAU

The project is focused on the student mapping and developing a self-chosen theme of design research. This means to read and understand state-of-art material, identify possible areas of investigation, to insert and/or develop methods of investigation and to conduct design research through prototype experiments. The semester simulates the processes of design research and nurtures the student in self-engaged academic activities where processes of uncertainty and critical thinking are central.

'Aero Architectural Studio' (5 ECTS course module), BA4Arch, AAU

The studio is organised in a series of 4 phases emphasizing on the shaping, organisation and construction of architectural structures driven by aerodynamic experiments evaluated through spatial, structural and environmental perspectives. In parallel to aerodynamic studies through CFD simulation, investigations into advanced methods of digital production techniques allow above to be explored from constructive principles, focusing on joints, fabrication and assembly techniques.

Website: <http://aerostudio2013.wordpress.com>

'Constructing Performative Urban Environments' (10 ECTS course module), URB1Arch, AAU

The aim of the studio is the construction and design of performative urban structures and environments. It explores the role of new technologies and their ability to develop performative urban structures, environments and designs in an integrated design process. The module presents theories of parametric design, cellular automata, material and structure in relation to theories of instant urbanism, cultural grafting and city life. The course will present concepts and the use of analogue and digital technologies related to performative urban spaces.

*Workshop (coordination, instructions and supervision)*

----- ■ 'Tectonics Beyond Technology' (3 ECTS), Utzon(x) Summer School 2013, MA.Arch, AAU  
'Materials and Photovoltaic Cells' (2 days), MA2Arch, AAU  
'Mass, Volume and Orientation' (3 days), MA2Arch, AAU

*Constructions in teaching*

'Tetraleaf Pavilion' Full-scale pavilion in plywood, MAArch, AAU (image below)  
'Aero Pavilion 2013' Full-scale construction in plywood, BA4Arch, AAU

2012:

*Lectures*

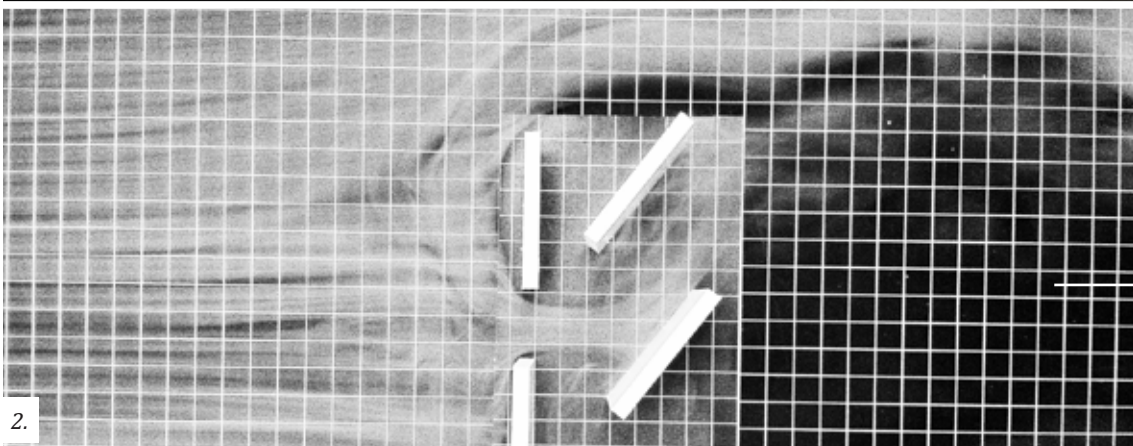
'Environmental Tectonics', MA2Arch, AAU  
'Natural and Human made Ecologies, BA4Arch, AAU

*Supervision and Examination*

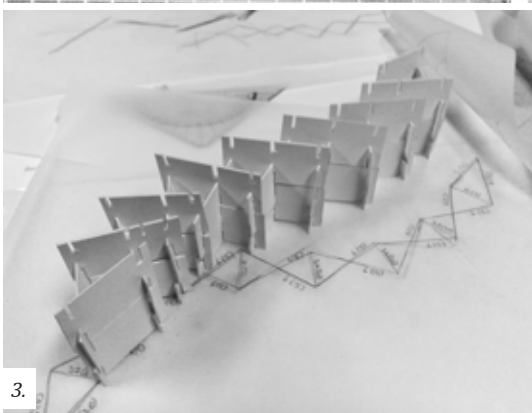
70 students, 'Parametric Urbanism', BA3Arch, AAU  
4 student groups, 'Sustainable Architecture', MA2Arch, AAU  
12 students, 'Internship in practice', MA3Arch, AAU



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**Aero Tectonic Studio 2011**  
[www.aerostudio.wordpress.com](http://www.aerostudio.wordpress.com)

1. Aero pavilion made from CNC processes, based on aerodynamic studies and installed next to the Utzon Center.

2. Students study aerodynamic conditions in a custom build wind tunnel for the studio projects.

3. Quick design model for later inspection in the wind tunnel.

Photos by IW Foged and Elias Mohr Jenen

*Coordination (development and organisation)*

'Parametric Urbanism' (5 ECTS course module), BA3Urb, AAU

The aim of the studio is the construction and design of performative urban structures and environments. It explores the role of new technologies and their ability to develop performative urban structures, environments and designs in an integrated design process. The module presents theories of parametric design, material and structure in relation to theories of instant urbanism, cultural grafting and city life. The course will present concepts and the use of analogue and digital technologies related to performative urban spaces.

'Sustainable Architecture' (20 ECTS project module), MA2Arch, AAU

*Workshop (coordination, instructions and supervision)*

'Kinematic Drawing Machines', BA3Art, AAU

'Materials and Photovoltaic Cells' (2 days), MA2Arch, AAU

'Mass, Volume and Orientation' (3 days), MA2Arch, AAU

2011:

*Lectures*

'Kinetic Systems', BA4, AAU

'Responsive Architectural Systems', BA5DigitalArch, AAU

'Generative Architectural Systems', BA5DigitalArch, AAU

'Architectural Representation through History', BA3Arch, AAU

'Aerodynamic Architecture', BA4Arch, AAU

'Dynamic Architecture', MA.Arch, Oslo School of Architecture

'Adaptive Tectonic Architecture', MA1Arch, AAU

*Supervision and Examination*

6 students, 'Responsive Architectural Systems', BA5DigitalArch, AAU

6 students, 'Generative Architectural Systems', BA5DigitalArch, AAU

70 students, 'Aero Architectural Studio', BA4Arch, AAU

4 student groups, 'Minimalist Housing Design', BA3Arch, AAU

4 student groups, 'Office Building Design', BA6Arch, AAU

*Coordination (development and organisation)*

'Responsive Architectural Systems' (5 ECTS course module), BA5DigitalArch, AAU

The Responsive Architectural Studio investigates adaptive behaviour through continuous feedback between developed models and climatic data. It pursues questions of dynamic expressions and performances in architectural design and aims towards a readable relation between the built and the natural environment.

'Generative Architectural Systems' (5 ECTS course module), BA5DigitalArch, AAU

The Generative Architectural Studio introduces computer-based strategies for generative systems within an environmental oriented architectural framework. Programming skills are developed and inserted into a design methodology that investigates the organisation of a membrane connecting an existing building with the climatic environment.

----- ■ 'Aero Architectural Studio' (5 ECTS course module), BA4Arch, AAU

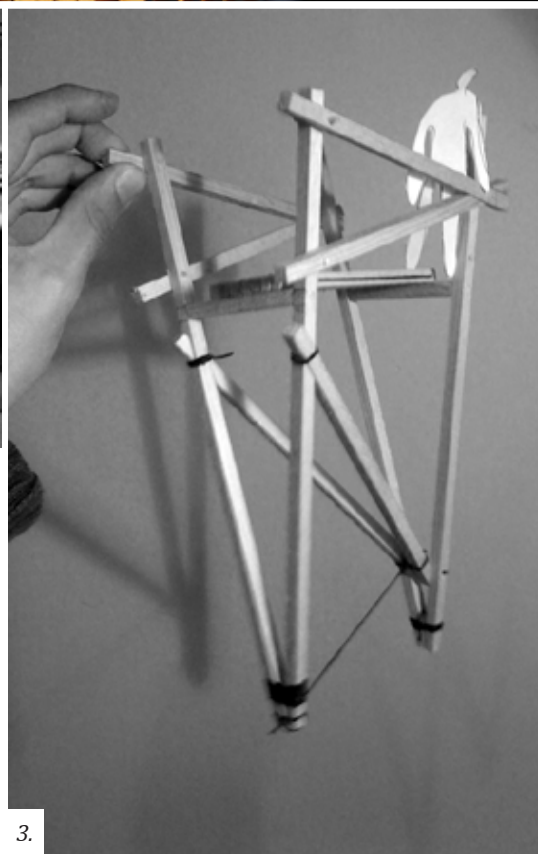
The studio is organised in a series of 5 phases emphasizing on the shaping, organisation and construction of architectural structures driven by aerodynamic experiments evaluated through spatial, structural and environmental perspectives. This resembles a morphogenetic procedure through looping experiments, observations, registrations and alterations focusing on air velocity, pressure



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### ***Tectonic Studio 2010***

[www.tectonicstudio.wordpress.com](http://www.tectonicstudio.wordpress.com)

*1. Bridge design from the formation of similar wood elements into a composition.*

*2. Students explore designs based on physical models and hand sketches.*

*3. Preliminary model of a bridge design system for later expansion into a full span bridge design.*

*Photos by IW Foged*

zones, turbulence and material and spatial composition towards new aerodynamic architectural design solutions. In parallel investigations into advanced methods of digital production techniques allow above to be explored from constructive principles, focusing on joints, fabrication and assembly techniques. Web: <http://aerostudio.wordpress.com>

*Workshop (coordination, instructions and supervision)*

'Environmental Modulation' (2 days), MA2Arch, AAU  
'Materials and Photovoltaic Cells' (2 days), MA2Arch, AAU  
'Mass, Volume and Orientation' (3 days), MA2Arch, AAU

*Constructions in teaching*

'Aero Pavilion 2011' Full-scale pavilion in plywood, BA4Arch, AAU (image below)

2010:

*Lectures*

'Responsive Architecture', MA.Arch, Workshop, AAU  
'Design Thinking', MA1Arch, AAU  
'Design Intelligence', MA1Arch, AAU  
'Design Methods', MA1Arch, AAU  
'Design Models', MA1Arch, AAU  
'Performative Architecture', MA.Arch, University of Bologna

*Supervision and Examination*

90 students, 'Tectonic Studio', MA1Arch course module, AAU  
5 student groups, 'Tectonic Architecture', MA1Arch, project module, AAU

----- ■ *Coordination (development and organisation)*

'Tectonic Studio' (7 ECTS course module), MA1Arch course module, AAU

The studio is organised as an intensive 'laboratory' on aesthetical, theoretical, scientific and practical issues defining tectonics as a discourse within architecture. Teachings in tectonic terminology, its historical outline and key people within this approach are illustrated and discussed, while hands-on intensive workshops seek to link from theoretical descriptions, via taught methods to applied tectonic representations in built models and drawings. The design progression leads from systemic investigations to the formation of a pedestrian bridge. The tectonic approach within the studio is based upon the key terms material, joint, assembly, system, geometry, addition and formation.

Website: <http://tectonicstudio.wordpress.com>

'Tectonic Architecture' (23 ECTS), MA1Arch, project module, AAU

2009:

*Lecture*

'Form-finding in Architecture', MA1Arch., AAU

2008:

*Lecture*

'Computational Sustainable Architecture', MA2Arch., AAU

*Workshop*

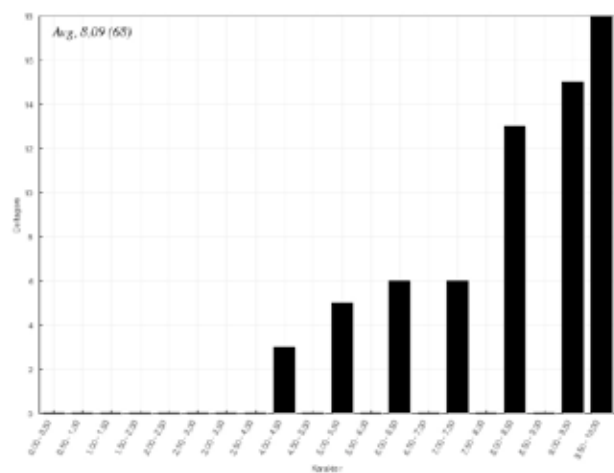
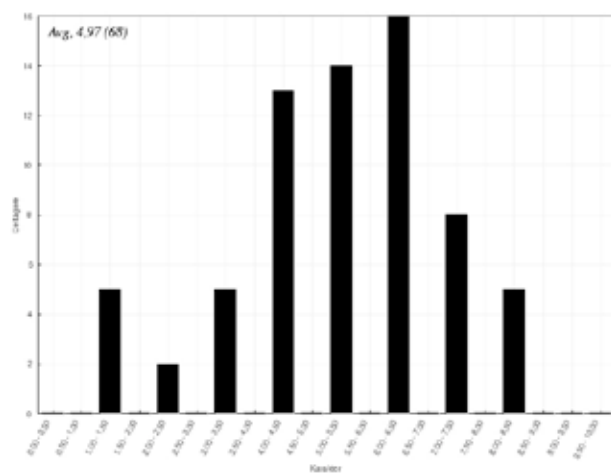
Paracloud parametric modeling, MA.Arch, AAU

2007:

*Lecture*

'Computational Sustainable Architecture', MA2Arch., AAU





### Lecture impact

Lecture on architectural acoustics theory. Graph shows response of 76 students to a quiz on the topic made before and after the lecture. Across 10 questions, the average score was improved from 4.97 to 8.09 correct answers.

### 3. Didactic Modes, Strategies and Tactics

As response to my teaching philosophy, a series of didactic modes, strategies and tactics are applied. Within teaching modes, a series of teaching strategies and tactics are nested to support the teaching/learning intentions. Many are commonly known, and perhaps, a few are less used or known. Essentially, my teaching activities gravitates around the principle question:

*How to creative didactic processes, which stimulate curious, speculative and critical thinking, while ensuring the learning of threshold concepts?*

#### 3.1 Modes

##### *Studio Mode*

Studio mode processes are typically 2-4 weeks long, including a relatively explicit plan for assignments and aims. Threshold concepts are presented through lectures, podcasts, teaching documents and openly discussed via face-to-face supervision and as plenum discussions. The level of 'constructive alignment' (Biggs and Tang, 2007) is very high, as the specific task (solution domain), the teaching and the assessment is closely tied together. Studio mode serves often as a preliminary process to a project mode, based on explicit design directed intentions, which can be understood as solution-based learning (SPL) processes (Dorst and Cross 2001, Dorst 2007, Kruger and Cross, 2006). This combined attempts to ensure that students are well equipped with skills and knowledge, and which in turn enable switching between solution and problem oriented processes in project mode. To support the individual and collective learning activities, dedicated websites are made as knowledge banks, design logs and as platforms for dissemination.

##### *Project Mode*

Project mode processes are typically 8-16 weeks long, including a general outline with inserted explicit teaching session (workshops, lectures). It is a loose learning structure, governed by discussions through supervision, rather than extensive threshold concept knowledge transfer from teacher to student. Focus is placed on the development of competences in critically doing and thinking. Projects are often performed in groups centred around a student-defined problem and theories and methods for addressing this problem, leading to problem-based learning processes (PBL) (Kruger and Cross, 2006, Lawson, 2006).

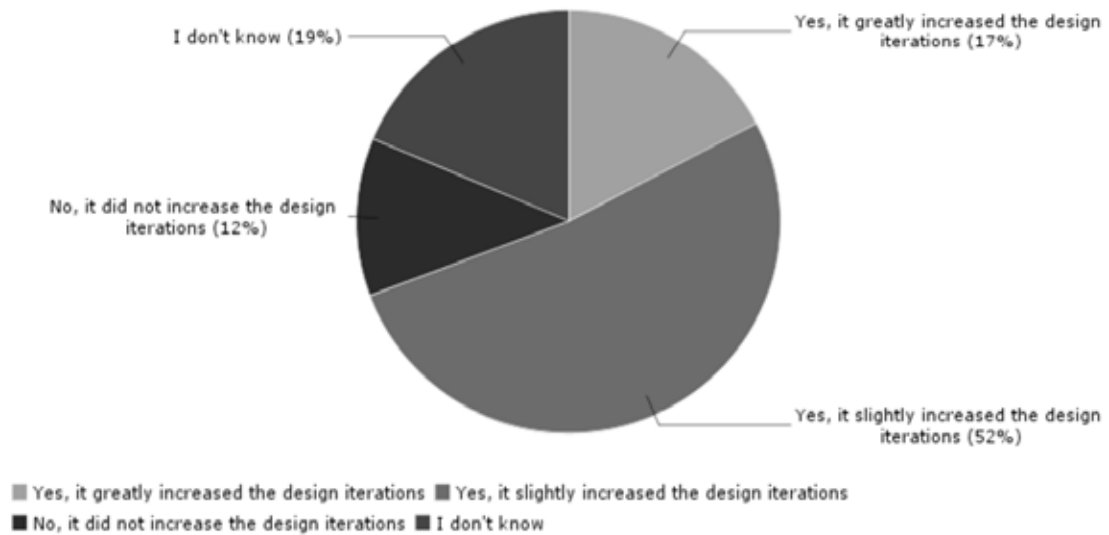
#### 3.2 Strategies and Tactics

##### *Lectures*

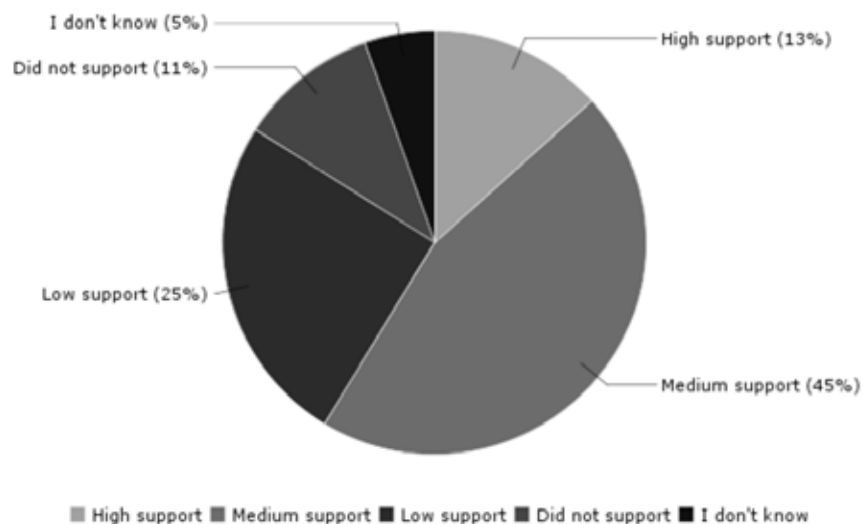
Lectures are typically performed in auditoria or larger seminar spaces with 50-100 students at the time present. The lecture format promotes a monologue condition, where students are primarily receiving information. The format is somehow promoted by the general institutional conditions by many students to few teaching hours.

Problems with this teaching format is a) an indirect relation to the student, b) knowledge transfer is based on a pre-described transfer process, such as chronological organised lecture slides, c) students are passive observers, often in a 'dark' room to make content on the lecture slides visible and d) the

12) Did the use of primary design drivers help to increase the number of design iterations, compared to working without primary design drivers in other design projects?



14) How much did the 'Element, System, Formation' design process support the iterative design process?



### Studio impact

Student survey including 20 questions grouped in three categories of parametric design, design processes and design knowledge. Above 2 graphs are related to design processes, which clearly indicate the capacities of the didactic model developed and the learning growth of the students.

acoustic properties of the lecture space varies greatly, meaning further decreased relation between educator and student. *What and how do I address above problems?* I typically 'design' my lectures. This means to start with a sketch of a timeline, including introduction, sections of core content, mind flip/disruptions and actual breaks and finishing.

*Introduction:* States the theme, an overview of the lecture content, threshold concepts and an intriguing illustration. It's my experience that students must be strongly invigorated to receive content from the first seconds of a lecture. Some lectures are started with a quiz of 10 questions on the lecture topic. This sets the theme and lets the students (and the teacher) get a very direct understanding of the knowledge level prior to the lecture session.

*Core content sections:* This is the delivery. This section must be very well 'illustrated', verbally and visually. Terminology and relations are established to existing knowledge. Ideally, students are involved with short questions in plenum, which link to the content. The core portions should not be longer than 15, maximum 20 minutes, and initiated with a specific title and a fast recap restating the threshold concepts. Generally, each lecture has 2-3 core content sections.

*Mind flip / Disruption:* At approximately every 10 minutes is installed a mind flip, or disruption, which intends to continue the lecture, but refreshing the students' mind. An example in a lecture on architectural acoustics is to 'blow' out classical music for 1 minute from the speakers, or a question on presentation slides suddenly appears, asking the students to 'ask your neighbour what his/hers favourite music is and why?' Disruptions are sudden, non-prior-informed actions, which maintain the students in the lecture context and theme, but displace their thinking and interaction with the otherwise single direction lecture format.

*Break:* After approximately 30 minutes (introduction + core section) an actual break of 5-10 minutes is inserted. Students are suggested to leave the room. Students often discuss the lecture content, but also social student life aspects. I appreciate both conversations.

*Finish:* As the last core section is ended a final section is included to reinstate the threshold concepts and to briefly go through the agenda presented in the introduction section. If the introduction included a quiz session, a new quiz with the same questions are done. Students are informed about this in the introduction, thereby encouraging them to grasp the lecture, making a basis for a better score. Students who improve their scores are encouraged to shout out, stating the improved knowledge on the topic. This also provides me with strong information of the learning growth as I can see general trends from the quiz feedback, but also what specific aspects students find difficult to comprehend, even after a lecture. Often, the lecture is related to a series of assignments, which are discussed prior leaving the auditoria. This serves additionally to spark conversation on the topic presented, linking lecture presentation to individual or group assignments.

*Images, Colours and Text:* Obviously, text must be readable for all students and limited in length and complexity where possible. However, I often include larger citations, as I understand the lecture slides to be valuable documents in their own right. This allows students to use the slides afterwards in a higher degree than if text bits are based on shortened and abbreviated structures only. I use



1.



2.



3.

### **Teaching and Student Exhibitions**

1. Discussion with student on manufacturing through robotic extrusion processes.

2. Student exhibition in the Utzon Center after Utzon(x) 2016 summer school

3. Student examination at Copenhagen School of Architecture, viewing project through VR.

Photos by MB Jensen, IW Foged and P Nicholas



motion images (animations and video) where possible. It is my experience that students are more receptive to information through this format and it allows for more informative representations of different phenomena such as sound waves, generative structures and thermodynamics. Photos are often paired in two, with a 'whole-object' image and a 'close-up', showing the depth and 3D of elements as much as the projected media allows. Photos are primarily black/white and only colours where needed to understand the photo content and specific information extracted from the photo. This is done to include visual variations throughout the presentation. It also adds a more clear visual identity to the presentation slides.

Delivering knowledge with a twist of humour is always an asset in my opinion. The best lecturers are often successfully including small remarks that break and continue the subject they are presenting. I am working to improve such skills.

#### *Online Fora*

Particularly with larger student groups many questions during supervision could be answered in a form of plenum context, both as direct answers and as basis for further discussions. For this reason I am making Q&A fora in both studio and project modes, which allow me to answer, even if I cannot be physically present at the specific time of the question. Students can then access this (at times) growing set of questions and answers and contribute themselves with additional information and experiences.

#### *Quizzes*

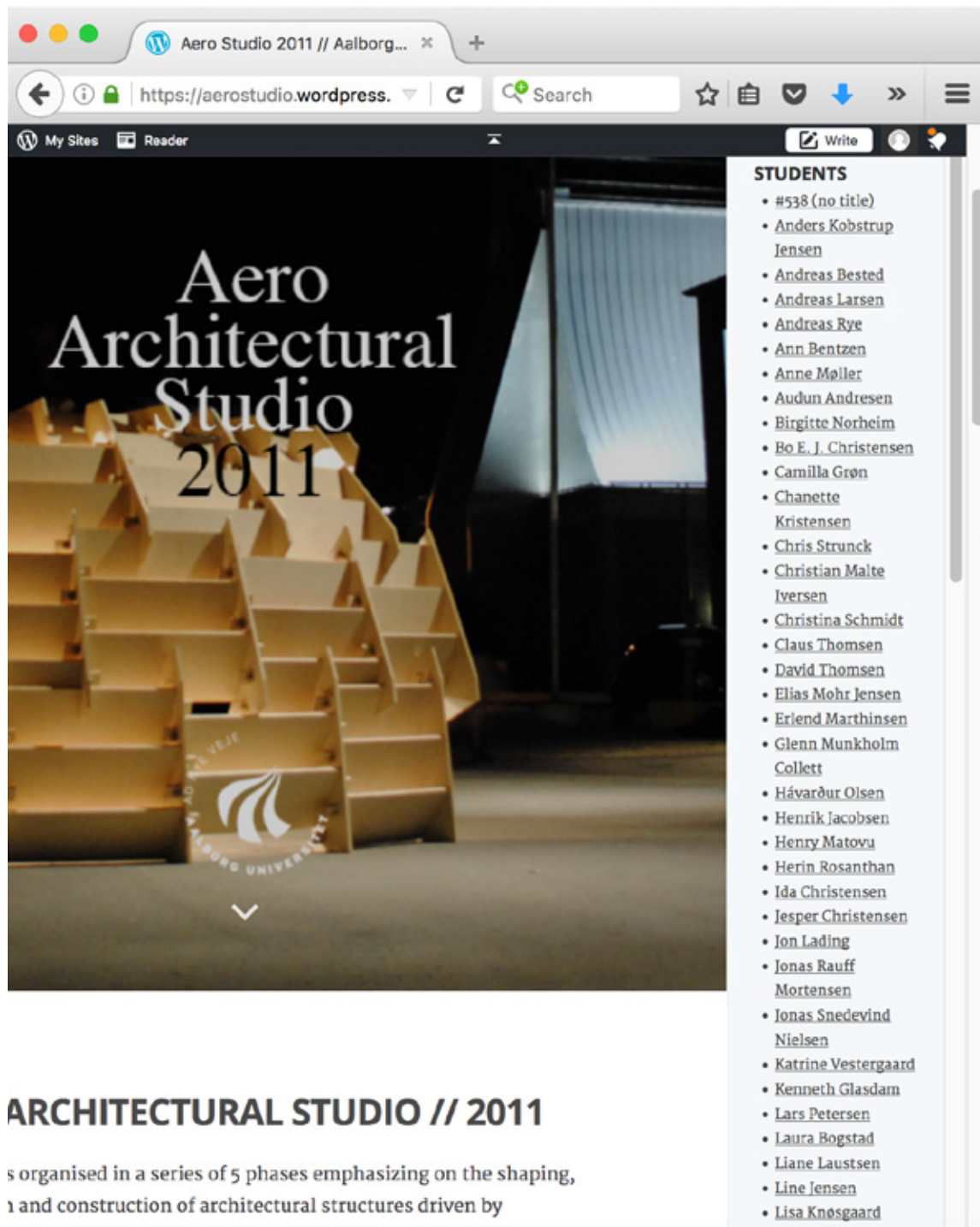
Using a quiz is quite new to me. However, I have come find it a both fun and productive strategy to enhance learning and detect aspects that are particular difficult to understand for the students. As I write above/below, I apply these in two ways (so far). As a way to identify student preferences within the general studies of architecture, and to get direct feedback on learning outcomes from lectures etc.

#### *Supervision Sessions*

This is a classical strategy/discipline in teaching, and perhaps the most important in my opinion. Face to face supervision sessions allow discussion of both core knowledge concepts and loose ideas emerging through conversation. In both individual and group supervision session I tend to ask much more than to deliver strong path guidance. To me, a question that makes the student find a trajectory forward is much more empowering. Obviously, objective facts and knowledge are delivered in concise phrasing, yet, core knowledge is discussed/questioned with the aim to train critical thinking. I am aware that many colleagues see supervision as a more formal context, asking for meeting agendas before supervision sessions. This is something I do not ask for, as the conversation ideally enables unbounded argumentation and restructuring of ideas rather than fulfilling a predetermined checklist of Q&A.

#### *Plenum Pin-up Sessions*

In studio and project modes, I typically insert plenum discussions. This allow students to observe and comment on each others projects (peer-review) through short presentations (3-8 minutes) followed by open discussion (5-15 minutes). All projects are pinned to a wall or floor, with all participants encircling the work developed. While asking direct questions, I see the the task of the teacher to equally facilitate conversation between students by guiding conversation, and adding points of critique, rather than being the sole reviewer. This, in my experience, engages students much more and create increased knowledge/idea transfer between projects. As a teaching tactic and as a student



#### *Aero Studio 2011 Teaching website*

*Website including information on theme, methods and tools, with links to relevant other sites/information/knowledge and a dedicated sub-page for each student to create a design log.*

reward to presenting a project (not always mandatory) the presenting student gets to choose who presents next, which often adds a bit of fun discussion when transition from one project to the next.

### *Workshops*

Workshops in my teaching are short (1-3 days) or long (4-14 days) with a carefully crafted (designed) programme, inserting a series of thematic threshold concepts, one or more design methodologies and very specific intended outcomes. Such conditions attempt to facilitate ('enforce') fast making and a high number of iterations within this timeframe, which are known to increase novel design decisions (Akin & Lin 1995). It trains particular creative cognitive muscles, which are not demanded in creative processes that are more open with more time available. I compare these processes to training specific exercises within a sports discipline, such as interval training in running, or the learning of a specific section of a larger piece of music by playing a series of scales. This is suggested to lead to experts knowledge and skills (Ericsson et al 1993, Ericsson 2007).

### *Design Schemas / Design Logs*

A design log or design schema is a semi-structured documentation of the studies conducted by the student. It is not necessarily intended as submission material, but a medium/strategy for students to identify, collect, preserve, articulate, discuss and disseminate the progression of their work. It reveals both to the student and the teacher the richness and complexity of creative tasks/progression and give the student better conditions for mapping and reflecting upon design aspects for further studies. Design logs are often combined with websites, enabling the work to be seen by others as it unfolds.

### *Podcasts*

I have come to understand podcasts as an asset, rather than a poor representation of a face-to-face lecture. By combining short key presentations organised as a string of learning events, the student is offered a much more student-oriented delivery as it is based on the learning pace of the student. That combined with the media possibility of overlaying 'static' visual material (images, videos) with audible material (voice over and music/sounds) and dynamic visual material (drawing on images/videos) support a method of knowledge transfer, which is qualitatively different to the other strategies applied.

### *Websites*

Websites are created as knowledge banks and platforms for collective thinking, and presentation. Each student has a dedicated page, which is used as a design log where developments are continuously uploaded and shared. The intention is to create a space for storing and sharing material and to subsequent use the website as means to communicate the teaching externally. What I have found particularly challenging with this format, is to get students to spend 10-15 minutes of the daily activities, despite its obvious qualities of supporting, documenting and disseminating their work to fellow students and others. In contrast, when the website becomes a content full space, it will provide the students with otherwise not accessible exposure. On that remark, one of my teaching sites has passed 115.000 views from all of the world, indicating the interest not only in the theme taught, but also the processes/projects that the students have undertaken.

#### **4. Overview of course administration**

*2016 – current:*

Member Board of Studies, Department for Architecture, Design and Media Technology  
Review of all study programmes and discussion/actions on study programme development.

*2015 – current:*

Coordinator of 4th semester project module, Thesis Project, MA Program  
Coordinator of 1st semester project module in Tectonic Design, MA program.  
Coordinator of 1st semester course module in Acoustic Tectonics, MA program

*2013 – current:*

Coordinator of Utzon(x) Summer School, BA, MA, PhD program (open to non-AAU students)

*2014:*

Coordinator of 3rd semester project module in Research by Design, MA program

*2013 :*

Coordinator of 5th semester course module Aero Tectonic Studio, BA program  
Coordinator of 1st semester course module Parametric Urbanism, MA program

*2012:*

Coordinator of 5th semester course module Parametric Urbanism, BA program

*2011:*

Coordinator of 5th semester course module Responsive Architecture, BA program  
Coordinator of 5th semester course module Generative Architecture, BA program  
Coordinator of 4th semester course module Aero Architecture, BA program

*2010:*

Coordinator of 1st semester course module Tectonic Studio, MA program  
Coordinator of 1st semester project module Tectonic Architecture, MA program

#### **5. Overview of qualifications within the field of university pedagogy**

##### *5.1 University pedagogy seminars*

*2016:*

2nd Adjunktpædagogikum Seminar, AAU  
3rd Adjunktpædagogikum Seminar, AAU  
Teaching and learning in Higher Education (HE) (University pedagogy, AAU  
AAU annual teaching day 2016, AAU  
AD:MT Undervisningsdag 2016, AAU

*2015:*

1st Adjunktpædagogikum Seminar, AAU

##### *5.2 English Language Certification Process:*

*2016:*

LACS C1 English Certification Exam

*2015:*

LACS C1 English Language Screening Session

2014:

TOEFL IBT English Language Test

### *5.3 Workshop participation on university pedagogy*

2016:

Workshop 6: Integration of ICT into PBL active learning

2 x ½ day meetings + assignment on experiences with use of ICT techniques, use of COED cards and mapping of possible new methods

Workshop 7: Flipped Courses in Higher Education

2x ½ day meeting + assignment on making a 7-10 min. podcast for review

### *5.4 Publications on university pedagogy and teaching processes*

Foged, IW. (submitted, 2017) 'Architectural Integrated Design Processes by Sequential Primary Generators'. Submitted to Journal of Architectural Education. Based on teaching and surveys from MS-c1Arch TSE modules 2015 and 2016 (Acoustic Studio). (Journal article)

Foged, IW. (accepted, 2017) 'Integrating Acoustics in Architectural Design Education through Computation' CAADFutures2017 Conference, Istanbul, Turkey. (Conference article)

Foged, IW. (2016) 'Experimental Vectors Between Practice and Research in Architecture', in Bricks / Systems ed. Foged, IW., Aalborg University Press. (Book chapter)

Jensen, MB & Foged, IW 2014, Cellular Automata as a learning process in Architecture and Urban design. in E Mine Thompson (ed.), Fusion - Proceedings of the 32nd eCAADe Conference. vol. 1, eCAADe, Newcastle upon Tyne, England, UK, pp. 297-302. (Conference article)

Foged, IW. (2012), 'On Tectonic Terms'. Aalborg University Press. (Book)

### *5. Peer Group meetings*

During AP, I have predominantly been participating in informal meetings in peer groups, typically before and after AP modules. This has been the most fruitful approach as we could discuss our teaching in a specific context. Conversations has been held periodically with Anne Kirkegaard Bejder, Gunvor Riber Larsen and Simon Wind, as well as other colleagues, particularly Marie Frier, Dario Parigi, Mads Brath and Ditte Bendix Lanng.

In parallel to AAU peer meetings, I engage in didactic models when visiting/teaching at the Danish Royal Academy of Fine Arts, School of Architecture. Discussions are centred around learning models that are related to design research, complex modelling processes and strategic modes for supporting novel student work. Conversations have been with Paul Nicholas, Phil Ayers and Mette Ramsgaard Thomsen.



## **6. Overview of competence development and development of new teaching material**

### *6.1 New teaching modules*

2016

'Acoustic Tectonic Studio 2016' (5 ECTS course module), MA1Arch, AAU  
Collaboration with Keflico (material sponsor)

2015

'Acoustic Tectonic Studio 2015' (5 ECTS course module), MA1Arch, AAU  
Collaboration with Keflico (material sponsor)

'Tectonic Architecture' (20 ECTS project module), MA1Arch, AAU

2013

'Design Research' (30 ECTS project module), MA3Arch, AAU

'Aero Architectural Studio 2013' (5 ECTS course module), BA4Arch, AAU

Collaboration with Keflico (material sponsor)

'Constructing Performative Urban Environments' (10 ECTS course module), MA1Arch

2012

'Parametric Urbanism' (5 ECTS course module), BA3Arch, AAU

2011

'Responsive Architectural Systems' (5 ECTS course module), BA5DigitalArch, AAU

'Generative Architectural Systems' (5 ECTS course module), BA5DigitalArch, AAU

'Aero Architectural Studio 2011' (5 ECTS course module), BA4Arch, AAU

Collaboration with Keflico (material sponsor)

2010

'Tectonic Studio' (7 ECTS course module), MA1Arch course module, AAU

### *6.2 New teaching workshops*

2016

'Robotic Making' (3 ECTS), Utzon(x) Summer School 2016, MA.Arch, AAU

Collaboration with Association for Robots in Architecture, JHA, Utzon Center

2014

'Bricks Beyond Technology' (3 ECTS), Utzon(x) Summer School 2014, MA.Arch, AAU

Collaboration with Randers Tegl, Weber, Utzon Center

2013

'Tectonics Beyond Technology' (3 ECTS), Utzon(x) Summer School 2013, MA.Arch, AAU

Collaboration with Keflico, AKT II, 3XN Architects, Utzon Center

2012

'Kinematic Drawing Machines' (2 days), BA3Art, AAU 2011 'Environmental Modulation'  
(2 days), MA2Arch, AAU

2011

'Materials and Photovoltaic Cells' (2 days), MA2Arch, AAU

2011

'Mass, Volume and Orientation' (3 days), MA2Arch, AAU (continuously developed since 2011)

2010

'Responsive Design' (5 days), MA.Arch, AAU

Collaboration with Festo (sponsors of sensors, actuators, valves etc.)

2008

'Paracloud parametric modeling' (2 days), MA.Arch, AAU

### *6.3 Analyses and Reports*

2016

'Post-analysis of student knowledge growth report'

Survey made to get deeper understanding of the MSc1Arch student's knowledge, competences and skills on the subjects, 'digital design' and 'design knowledge'. The basis for the survey was to find ways to improve the master programme towards thesis and bachelor programme towards master programme. The learning from the study was implemented into the 'IT Progression at A&D report 2015' submitted to the A&D Study Board.

2015

'IT Progression at A&D report'

Further development of the IT Progression report (2011), but including the master programme. The report is also based on the direct feedback from students during teaching and by a survey among MSc1Arch students ('post-analysis of students knowledge growth'). The report concludes with written suggestions and graphs how to integrate digital and advanced computational tools and methods during the whole A&D education, particularly aimed at the architectural design branch.

2011

'IT Progression at A&D report'

Development of an IT progression study at the A&D education to integrate digital tools and methods through the bachelor education. The document is based on a survey made to rank relevant design software for its pedagogical level, complexity to handle design tasks and when and how to integrate into education in relation to the specific curriculum at A&D. The report concludes with written suggestions, supported with a graph of when to integrate what digital tools and how many lectures that are required.

## **7. Teaching awards and recognitions**

2016 - current

Statements from colleagues (appendices A and B)

2013 - current

Testimonials from students (appendix D)

2012 - current

Invited critic and lecturer at Royal Academy of Fine Arts, Copenhagen School of Architecture

2011

'Teacher of the year' (2011) Institute for Architecture & Design, Aalborg University (appendix C)

## **8. Goals you have set yourself as part of AP.**

I consider my teaching strengths to be interesting lectures with mix of theory and applied example presented with different media, engaging face-to-face tutoring and the continuous development of new 'studio mode' modules. On the flip side, I consider my teaching weaknesses to sometimes applying too ambitious processes and goals on behalf of the students. Constructive alignment should have higher focus. Being a passionate educator, I tend to plan ahead, but this also means to involve students very little in teaching preparation.

Hence, I am aiming to improve student integration in the understanding, discussion and organization of activities and to more explicitly read and observe the individual goals of the students in relation to the study assignments.

## **9. Changes you have carried out on own initiative based on student feedback.**

### *9.1 To better understand the students from day one*

I have changed the introduction lectures to studios and projects, from being solely academic topic content, to also and more explicitly include arguments and descriptions on pedagogic/didactic strategies during the semesters. Making the student understand the learning conditions and what is required in the learning process has gained increasing importance. This means to explain what methods students are expected to learn and how they are intended applied, but also where students are left more 'alone'. It also includes a detailed timeline of the semester, revealing to the students intensive periods of threshold learning and less intensive periods of open study activities by guidance. Along with thoroughly explaining task and threshold concepts, this improves constructive alignment between the assignments, the teaching and the assessment.

I have developed quizzes for two purposes, as a fun element to 'test' knowledge and to identify the different interests and ambitions of the students. As an example, the semester introduction includes a quiz with ten questions (using the service [www.kahoot.it](http://www.kahoot.it)) e.g. listing four architects, four styles of architecture, four texts on theory etc. The students find it very funny to see what their fellow students think, and I get a direct understanding of their preferences and positions in architecture.

### *9.2 To better trim teaching to both individual and collective ambitions:*

I have developed a second method of using quizzes (using the CMS [www.moodle.com](http://www.moodle.com)) (as described under point 3). This is to make a specific quiz related to a lecture content. The quiz is done prior and after the lecture. This engages students in a new way, where only themselves (and the teacher) see their improvements. It becomes very explicit what they need to study more intensively and I, as the teacher, get direct insight into aspect which needs to be further elaborated.

I have started developing podcasts (using the software [www.ExplainEverything.com](http://www.ExplainEverything.com)), which are 7-10 minutes long video sections with highly specified content. It includes lecture slides, voice over and me drawing on top of the slides as I present and discuss the specific topic. This allows the students

to see/listen content as many times as needed for them to understand the topic studied. The added layer of drawing directly on the slides is a unique feature I have not seen elsewhere and which have received positive comments from fellow teachers. I have yet to get response from students on these podcasts. Making these podcasts are, however, a very time consuming activity.

## **10. Reflections on how you achieved your goals and changes implemented as part of AP.**

### *10.1 Boundary conditions (time and space)*

When working with larger student groups (50+ students) in architecture, the physical learning environment seems to become increasingly important. To maintain a good dialogue and engage students in constructive and reflective discussions and making, spaces which has a high acoustic, daylight and visual quality is important. This is the case for all learning environments, but as we discuss models, sketches and processes in plenum, focus between teacher and student is strongly helped by good spatial/environmental conditions. For this reason I am very aware to the setup of the space, how students are positioned and how I move/situate myself in open discussions.

Additionally, the physical environment have direct impact on how we organise our teaching, as practical concerns are central, e.g. when having 85 students making 1:1 prototypes for then to discuss the making. In similarity, we move all students from their normal group desks to a designated workshop space to change the introverted groups to a much more open collective for 2-3 days, which explores together, rather than separated. This stimulates open questions and different discussions on problem and solutions are made possible across project groups, where I as a teacher become the facilitator/director of discussions, rather than lecturing content. Tactics on this is described under section 3, e.g. pin-up sessions.

Effectively, this means to construct variations in learning environments from fixed in location, space and time with massively collective conditions during open workshops/discussions to very intimate and mobile conditions when watching a podcast on the smartphone somewhere in a quiet corner, based on very specific lecturing content. Hence, to accommodate the different learning situations, depending on student group size and type of learning, I have (also) during AP developed different environments and learning strategies, as described in point 3, which appear to support teaching/learning in both large collective groups and as individual students.

### *10.2 Complexity*

With the high complexity of studying architecture + engineering, I realised that complexity is an aspect which can be controlled and instrumentalised. This is what has resulted in the two didactic modes (studio, project), which intent to allow short, intensive direct learning conditions and longer, low-intensive indirect learning conditions. This also intents to support progression from one theme to another, as both thresholds concepts are covered, predominantly in studio mode, while new creative, reflective and uncertain paths are instilled in a project mode. Furthermore, I have become more aware of the time it takes students to understand and learn design making and that the act of creative processes should be supported by both bounded (fixed complexity) and unbounded (open complexity) didactic processes as described above.

## **11. Plans for future development/research activities related to teaching supervision.**

I plan to further develop and reflect upon the modes, strategies and tactics discussed above. Progress is based on direct student feedback and indirect feedback by observing students learning progression and response to different didactic activities. Making surveys/quizzes has appeared as an an instrumental and fun way to engage students in own learning advancements, and allowing me to understand some problems related to the teaching given. Podcasts may give the same feedback by logging views of each podcast, simply by 'equalling' views with difficulty of understanding the specific topic taught.

In practice, the problem with making/including these strategies/tactics in teaching is that they are very time consuming and do not match the institutional intended time for preparing teaching activities.

Framed under five headings (a structure adopted from Paul Nicholas) I plan to progress my teaching:

### *Technology*

Via research to explore, develop an integrate novel information and educational technologies, which explore in tandem both the technology and what it can provide for architecture and its didactics.

### *Research-based teaching*

By informing all teaching activities in direct relation to my on-going research of 'Environmental Tectonics' and its associated fields.

### *Interdisciplinarity*

By seeking interdisciplinary methods and models, particularly with related fields, which support complex and integrative design processes.

### *Communication*

By disseminating teaching ideas, processes and methods via daily discussions, exhibitions, websites and publications at different academic and non-academic institutions/communities.

### *Leadership*

By maintaining and developing new didactic modes in my position as a research leader and experimental educator through exploratory, concise and constructive design models.



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### 13. Appendix A - Statement - Mads Brath Jensen

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DENMARK

27.01.2017



DEPARTMENT OF  
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#### Statement on University Pedagogics

MADS BRATH JENSEN  
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During the last years Isak Worre Foged has been arranging several different teaching modules targeting the master students at the Architecture specialization, at Department of Architecture, Design and Media Technology, Aalborg University. By teaching and developing University pedagogics with Isak, I have come to understand that the main idea behind the structuring of his teaching has been to work with a structured experimental-based design process where the outcome is a 1:1 scaled architectural prototype. Through these teaching modules Isak has developed a clear and highly structured design method that the students should follow when running the course featuring a set of daily process schemes in which the students can enter their data/results, but that also assists in giving the students an overview of the entire process as well as encouraging them to reflect upon their work. The design method that Isak has developed is based on a bottom-up process where simple experimental design tasks are gradually being informed with additional parameters to be considered and new restraints to work within. The manner in which Isak has structured these courses helps the students to focus on very simple tasks and learn to develop and reflect on these initial experiments before advancing to more complex designs.

When teaching the master students at the architecture specialization Isak shifts between theoretical based subjects and how these are applied to the field of architecture – the latter often through relevant case studies and diagrams that simplifies the taught material. By conveying his material from several points of view the students often have an easier time understanding the material. Isaks teaching almost often contains a subsequent hands-on assignment and when supervising these sessions/workshops he is focus on drawing parallels between the taught theoretical material and the student's current design task/challenge.

A handwritten signature in black ink, appearing to read "Mads Brath Jensen".

Mads Brath Jensen  
Lab. engineer  
Department of Architecture, Design and Media Technology  
Aalborg University

### 13. Appendix B - Statement - Phil Ayers and Paul Nicholas



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info@kadk.dk

01 February 2017

#### ***Pedagogical Statement for Isak Worre Foged***

To whom it may concern

This pedagogical statement endorses Isak Worre Foged's (IWF) capabilities as a conscientious, dedicated and professional educator within Architectural Design education at Master's level. This judgement is based on experience of IWF's pedagogy in the context of the Master's programme CITAstudio: Computation in Architecture based within the Institute for Architecture and Technology, KADK.

CITAstudio is an established two-year Masters level programme that focuses upon examining architectural issues through critically situating computation and digital technologies in the processes of thinking, forming and producing architecture. It places particular design emphasis on the intersection between computation, fabrication, material and performance. In addition, the programme is directly associated with the internationally recognised research center CITA, and therefore draws directly from the center's expertise and network. As such students gain experience from state-of-the-art research, a contextual grounding in relevant Architectural research practices, and, through their design work, focus on exercising methods of Research-by-Design. The pedagogy of CITAstudio empowers students with relevant skills in systematic enquiry, critical evaluation and design integration. These skills are essential for contemporary practice in which explicit interfaces to research are becoming an essential component of the design context.

As such, the context of CITAstudio supports IWF's pedagogical development by providing a teaching context that is strongly supported by research, structuring live projects that integrate pedagogy with research inquiry and by providing a rich tutoring landscape of individually led architectural design projects by an international body of students. In addition, teaching practice is exercised across a varied landscape of teaching modes that include individual student tutorials, formal critiques, running of group practice-based workshops, critical debate discussions with a focus on scholarship and theory, examinations, lectures and teaching with other peers.

Through his engagement with CITAstudio, IWF has supported and contributed to the teaching culture through his strong skills in design integration of computational strategies, his specific knowledge to support deep design consideration of thermal and acoustic behaviour in Architecture, his balanced pedagogy combining strong theoretical grounding and his broad knowledge of scientific methods and practice-based inquiry.

In combination with his inter-personal skills, approachability, passion for the subject and commitment to critically informed design quality of the highest standards, IWF possess a combination of attributes and characteristics that make him a pedagog of the highest quality.

*Phil Ayres, BA(hons) Dip.Arch PhD  
Associate Professor*

CITA | Centre for Information Technology and Architecture  
Royal Academy of Fine Arts, School of Architecture  
Philip de Langes Alle 10  
1435 Copenhagen K, Denmark



## Årets underviser

ved Det Teknisk-Naturvidenskabelige Fakultet

### Arkitektur og Design studienævnet Foråret 2011

Videnskabelig assistent

## Isak Worre Foged

Institut for Arkitektur og Medieteknologi

Aalborg, den 1. juli 2011

A handwritten signature in black ink, appearing to read "Henrik Harder".

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Studienævnetsformand Henrik Harder

### **13. Appendix C - Teaching Award Statement**

'On the basis of nominations 2010, Isak Worre Foged is awarded 'Teacher of the Year' at Architecture & Design 2011. He has through his role as supervisor and coordinator for the master programme 1st semester helped to inspire and renew education by breaking the traditional framework and create a new project proposal.

His focus on sharing knowledge and linkage between technical parameters and architectural form, helps putting the Architecture & Design program at the world map! With his profile, he is a role model for the educational programme and helps to raise students' academic skills so they become more competitive on the labor market.

Isak's engagement is unique, and he's really passionate about his work and to disclose knowledge. He has worked hard to get exciting and interesting workshops up and running with new methods and has given the students a huge motivation and inspiration for further work. Also during tutoring he shows a great enthusiasm while giving the student the freedom to experiment and challenge themselves.

Isak is selected as 'Teacher of the Year', as he has greatly contributed to making the first semester of the Master in Architecture programme a semester with high learning intensity and relevance to the student.'

Board of Studies Department of Architecture and Design, Aalborg University  
28 February 2011



*Q1: What do you think of the topic?*

A1: The topic was great, coupling robotic control with additive manufacturing. It is a topic that is currently being explored by other universities as well but not enough knowledge on that yet, so I believe there was a great balance of established knowledge and exploration.

*Q2: How was the lectures/tutoring?*

A2: Excellent ! All lecturers were highly competent and encouraged discussion and creative thinking.

*Q3: Did the summer school meet your expectations?*

A3: The Summer School absolutely met my expectations. All participants were very motivated and the team was great, comprising of people with different skill-sets, different background or experience which worked REALLY fine. The combination of people was amazing and there was a great spirit of collaboration among us.

*Q4: Is there something you could imagine to be different?*

A4: Not really! I wish there is enough dissemination of the work, which I am sure there will be (and off course I can help with that if you need people to write stuff, just let me know).

*Q5: Something else?*

A5: Yes! I wanted to say BIG congrats to you for organizing it, you did a GREAT job and to the whole team that made it happen. And also to thank you for giving us the opportunity to be part of it. Very grateful for being part of the team and very happy.

Ioanna Symeonidou (Greek PhD Student)

*Q1: What do you think of the topic?*

A1: The topic was amazing because able to merge innovative fabrication technique with tectonic studies related to thermal properties and not only as morphologies exploration;

*Q2: How was the lectures/tutoring?*

A2: The tutor and the lecturing was good. The lectures was clear and very interesting because focused on particular topic. The lecture of Elisa was very interesting and inspiring.

*Q3: Did the summer school meet your expectations?*

A3: The Summer School went beyond my expectations.

*Q4: Is there something you could imagine to be different?*

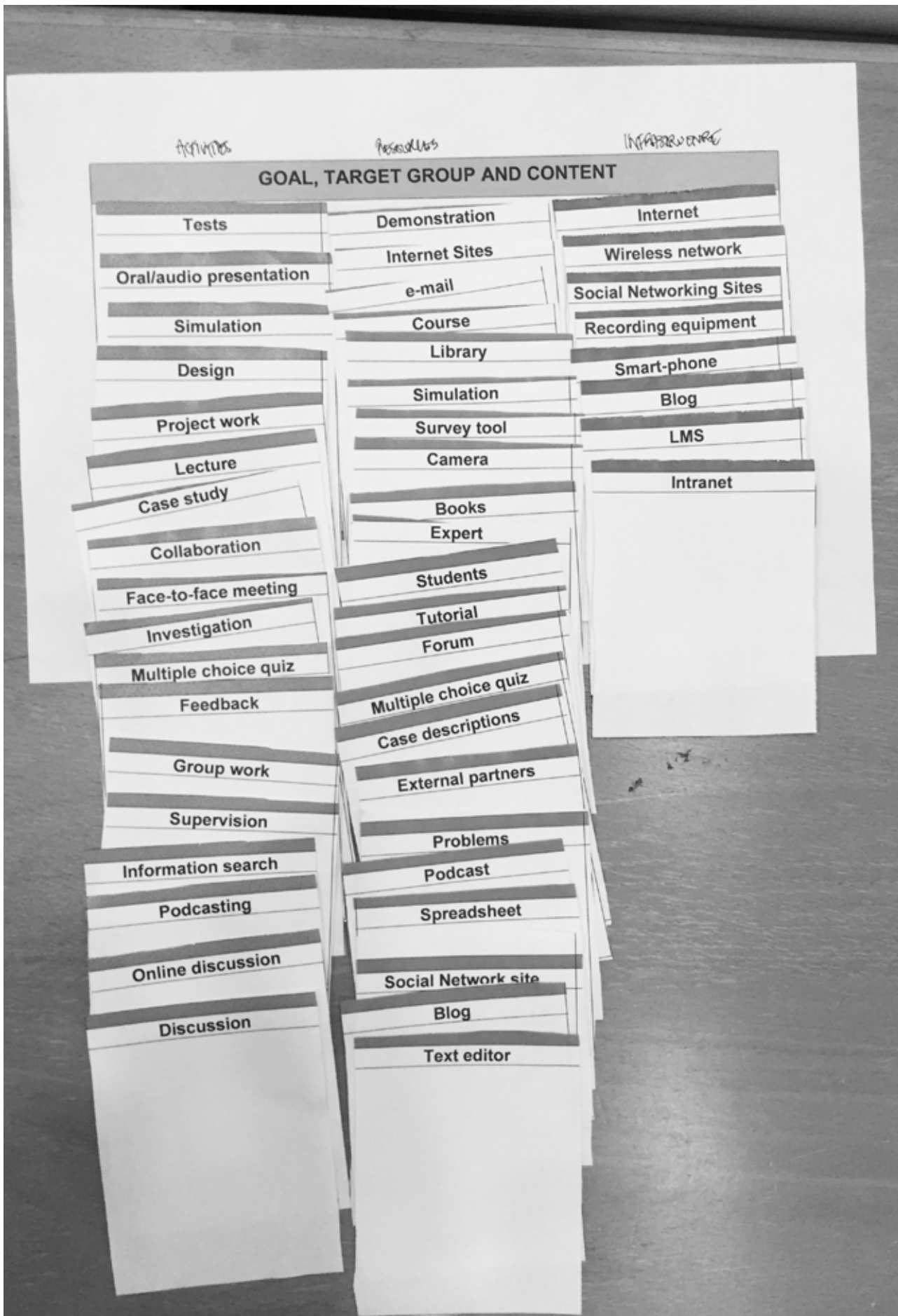
A4: Probably, the thermal aspect could be more developed and used as a guide parameter for the morphologies exploration but it is also related to time and knowledge that each of us have on the topic.

*Q5: Something else?*

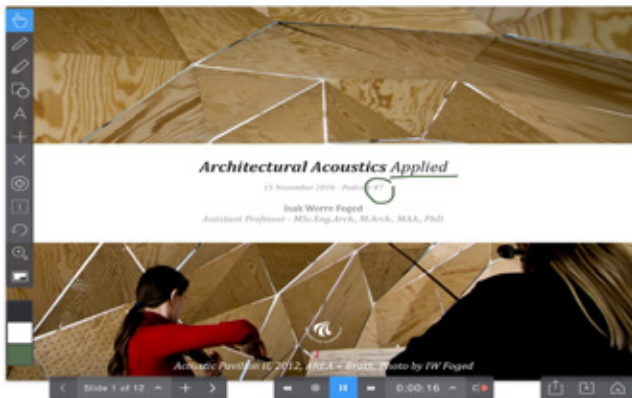
A5: It could be interesting try to propose the system as a device for active public space with the thermal properties that geometry and colors give to the wall. It will be nice also try to understand the thermal behaviour of the components for each different typology. Let us know if you will do it Isak.

Angelo Figliola (Italian PhD student)

13. Appendix E- AP WS 3 assignment - COED board



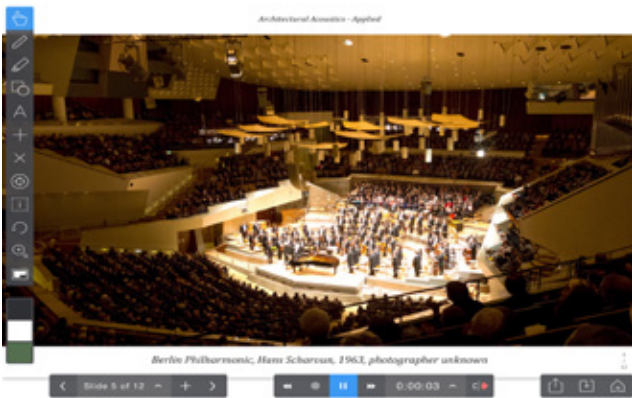
### 13. Appendix F - AP WS 7 assignment - podcast captures



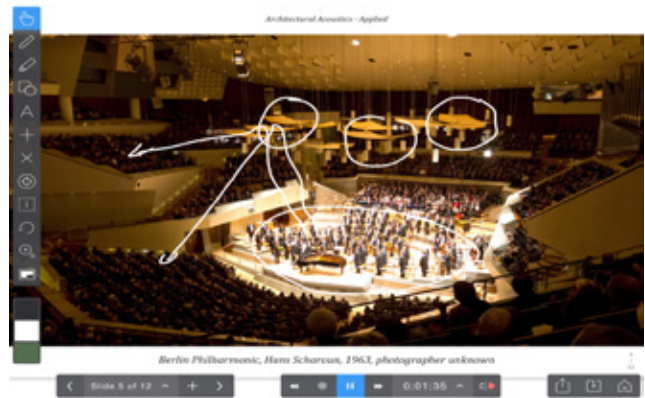
Capture 1



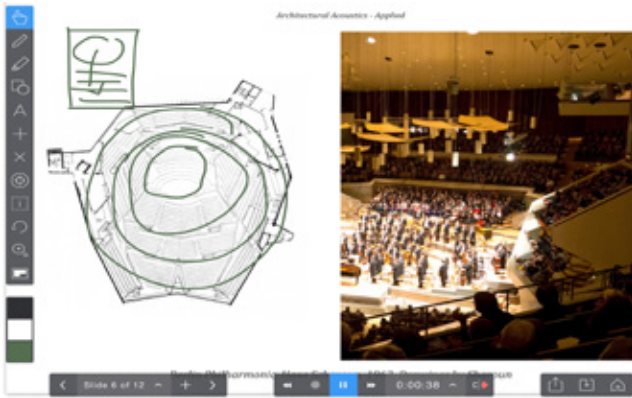
Capture 2



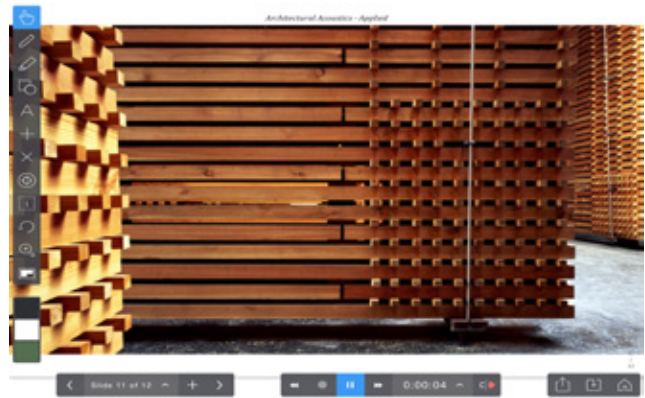
Capture 3



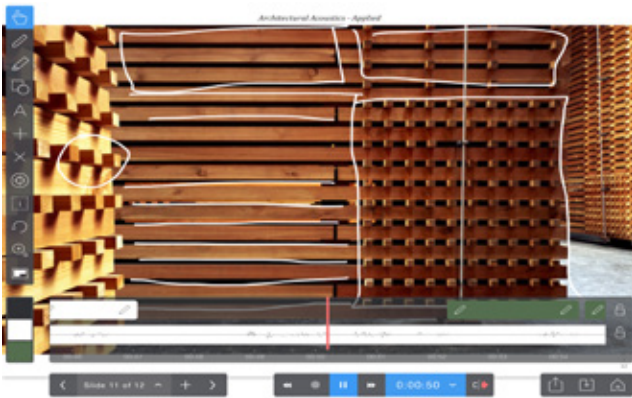
Capture 4



Capture 5



Capture 6



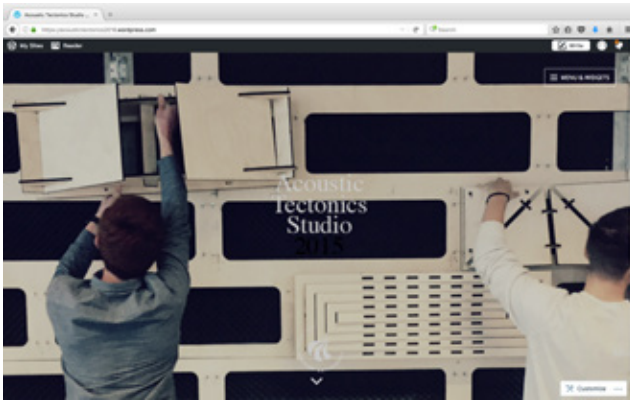
Capture 7



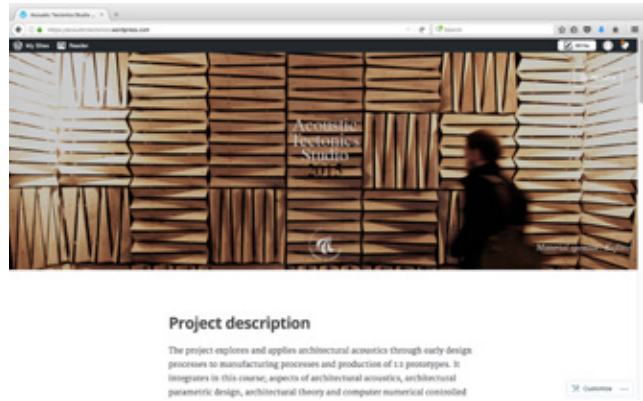
Capture 8



### 13. Appendix G - Teaching Websites



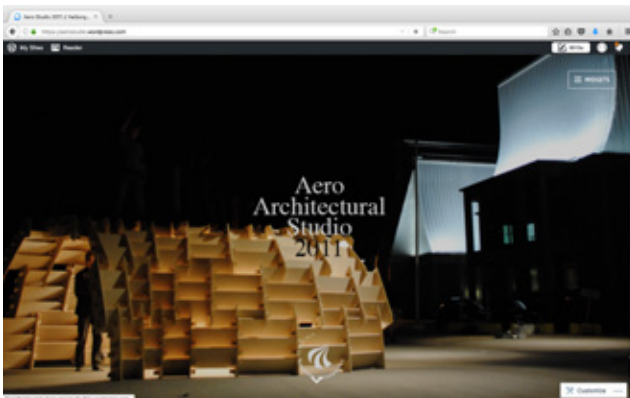
[www.acoustectonics2016.wordpress.com](http://www.acoustectonics2016.wordpress.com)



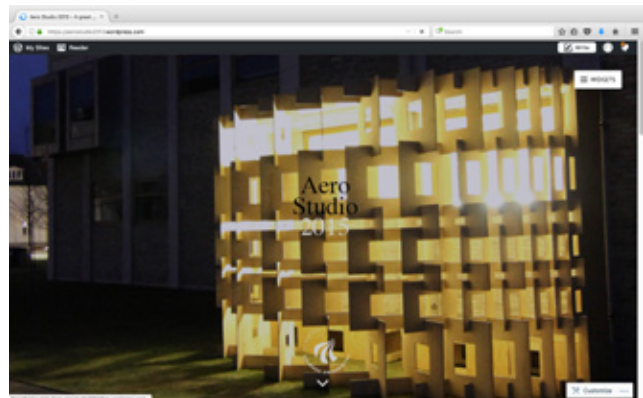
#### Project description

The project explores and applies architectural acoustics through early design processes to manufacturing processes and production of 1:1 prototypes. It integrates in this course, aspects of architectural acoustics, architectural parametric design, architectural theory and computer material control.

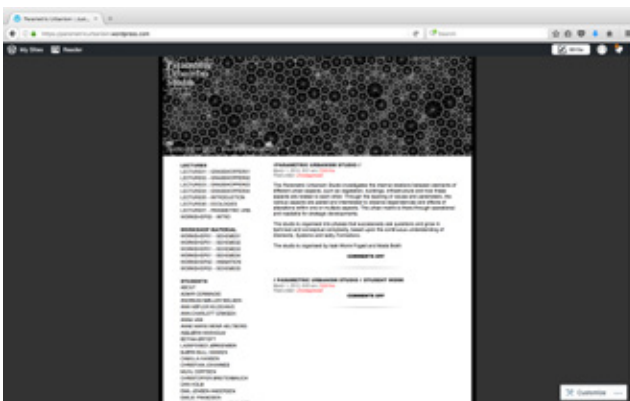
[www.acoustectonics.wordpress.com](http://www.acoustectonics.wordpress.com)



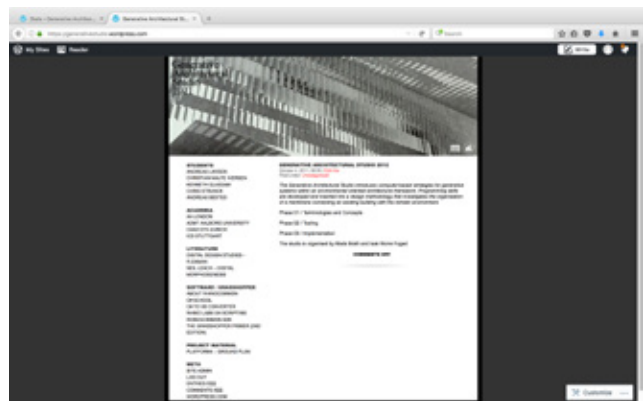
[www.aerostudio.wordpress.com](http://www.aerostudio.wordpress.com)



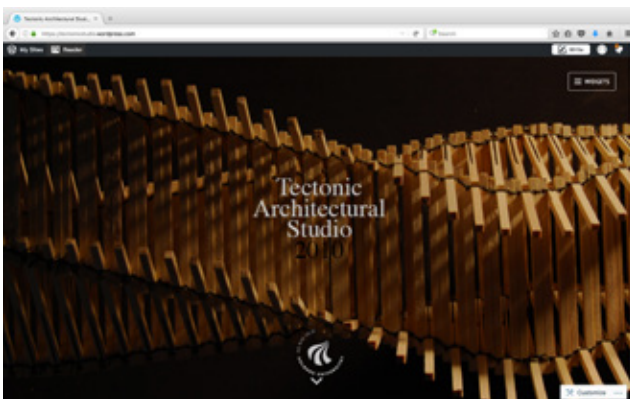
[www.aerostudio2013.wordpress.com](http://www.aerostudio2013.wordpress.com)



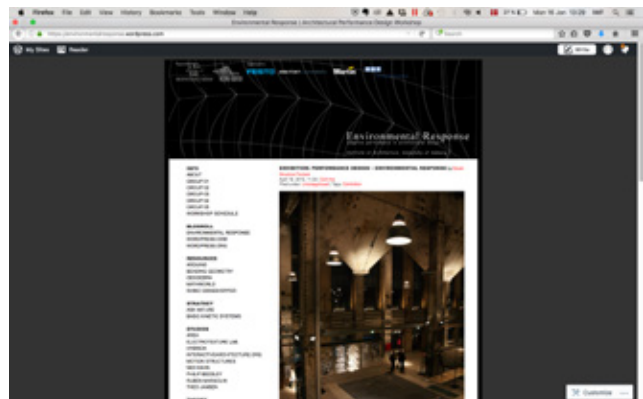
[www.parametricurbanism.wordpress.com](http://www.parametricurbanism.wordpress.com)



[www.generativestudio.wordpress.com](http://www.generativestudio.wordpress.com)



[www.tectonicstudio.wordpress.com](http://www.tectonicstudio.wordpress.com)



[www.environmentalresponse.wordpress.com](http://www.environmentalresponse.wordpress.com)



### 13. Appendix H- Utzon(x) Lectures / Symposia



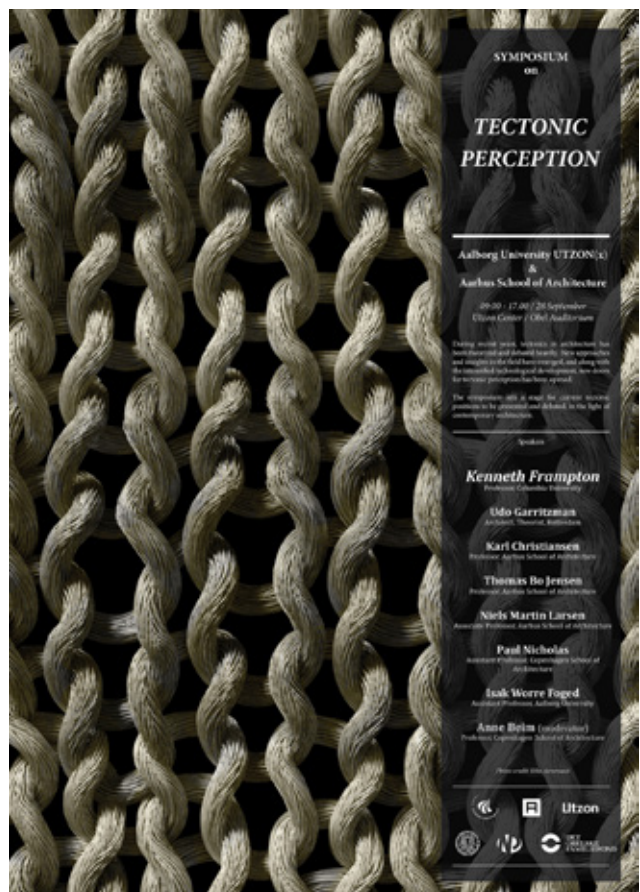
Utzon(x) Lecture 2012



Utzon(x) Symposium 2015



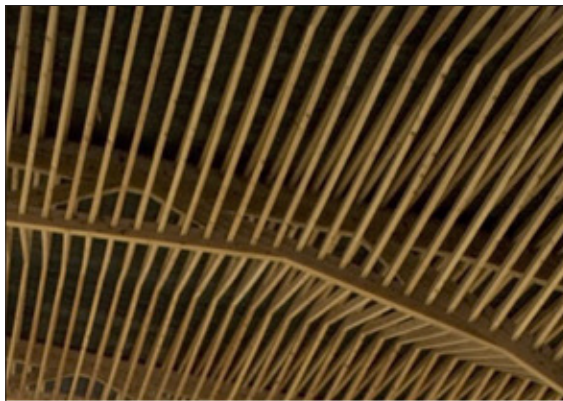
Utzon(x) Lecture 2015



Utzon(x) Symposium 2017



## 13. Appendix I - Workshop assignment hand-out



### MSc1Arch 2016 - Workshop 1

9-11 November 2016

Workshop organisation: Isak Worre Foged, Assistant Professor, AD/MT, AMU



#### 10 November

9.00

Pin-up: A round of brief presentations of key ideas, solutions and problems.

9.30 (Mini-groups, swap 11.00)

Assignment 2a: Structure of a chapel (1 ½ hour)

Based on the studies and studies of the church nave make 2-4 variations in sketches, physical models, digital models of these based on the size of chapel from the project brief.

Assignment 2b: Acoustics of a chapel (1 ½ hour)

Develop 2-4 variations of the chapel space geometry in sketches and 3D digital models. Make quick, simple acoustic simulation setups in Pachyderm. Consider materials (wood in principal) in relation to surfaces of the chapel.

Assignment 2c: Discuss and Synthesise (1 ½ hours)

Discuss and synthesise structural and acoustic investigations into one sketch/model.

14.00

Pachyderm Q&A

Arthur van der Harten, developer of the acoustic simulation software Pachyderm will be available via a Skype connection to the United States. The intention is to get a deeper and first rate connection to ideas and functionalities of acoustic simulations.

15.00

Assignment 3a: Structure of a children's chapel (1 hour)

Based on the studies and studies of the church nave and chapel make 2-4 variations in sketches, physical models, digital models of these based on the size of children's chapel from the project brief.

Assignment 3b: Acoustics of a children's chapel (1 hour)

Develop 2-4 variations of the children's chapel space geometry in sketches and 3D digital models. Make quick, simple acoustic simulation setups in Pachyderm. Consider materials (wood in principal) in relation to surfaces of the chapel.



Benedict Chapel, Peter Zumthor, 1988

Photo credits Felipe Camus

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#### Preparation

- 1) Bring your tools for sketching, model making (foam, wood, cardboard...), your computers.
- 2) Bring inspiration for your church project such as ideas of atmosphere, specific acoustic environments (acoustic values of RT60, D50, C80, SPL), images of case studies of structures and acoustic surfaces and materials.
- 3) Bring, as always, energy, constructive spirit and the desire to create!

#### 9 November

9.15 : Introduction

The introduction will reinstate some of the key acoustic concepts presented during the course module (TSE) in relation to acoustics and exemplify variations of expressive church structures. The intention is to frame the focus of the workshop and give a description of the workshop objective.

9.45 : Guided tour in the House of Music

House of Music: Guided tour with Peter Iversen from the House of Music

The guided tour will focus particularly on the acoustics of the concert halls, and there will be a unique possibility to observe and listen to the Aalborg Symphony practising. It is important that all participants are ready in the foyer latest 9.45. The university is funding the guided tour.

12.30 : Assignment 1 (Mini-groups, swap 14.00)

Assignment 1a: Structure of a church nave (1 ½ hour)

'Find' a structural inspiration (from course modules and own search) and make 2-4 variations in sketches, physical models, digital models of these based on the size of the church nave from the project brief.

Assignment 1b: Acoustics of a church nave (1 ½ hour)

Develop 2-4 variations of the church nave space geometry in sketches and 3D digital models. Make quick, simple acoustic simulation setups in Pachyderm. Consider materials (wood in principal) in relation to surfaces of the nave.

Assignment 1c: Discuss and Synthesise (1 ½ hours)

Discuss and synthesise structural and acoustic investigations into one sketch/model.



Christ of Light Church, Oakland California, SOM Architects, 2008

Photo credits SOM Architects

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#### 11 November

9.00

Assignment 3c: Discuss and Synthesise (1 ½ hours)

Discuss and synthesise structural and acoustic investigations into one sketch/model.

10.00

Synthesis structure and acoustics and document the material investigated and produced during the workshop for final workshop pinup.

12.30

Pin-up: We will discuss projects, ideas, solutions and problems in plenum. The format is projects in the middle, students and critics in a circle. We will select projects for 10 minutes discussion to cover the different aspects explored during the workshop. Jesper Theger Christensen will act as external critic.

14.00

End of workshop



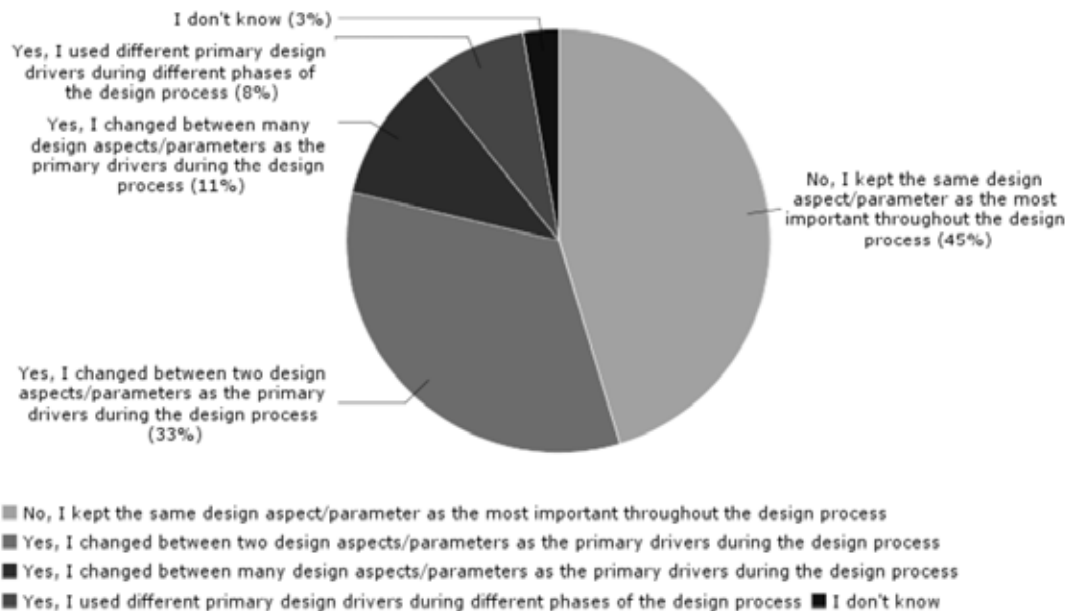
Sei Folk Museum, Hiroshi Naito, 1992

Photo credits Naito Architects

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### 13. Appendix J - Student survey graphs (response to 2 of 20 questions)

10) Did you shift aspects/parameters as the primary design driver during the design process?



12) Did the use of primary design drivers help to increase the number of design iterations, compared to working without primary design drivers in other design projects?

